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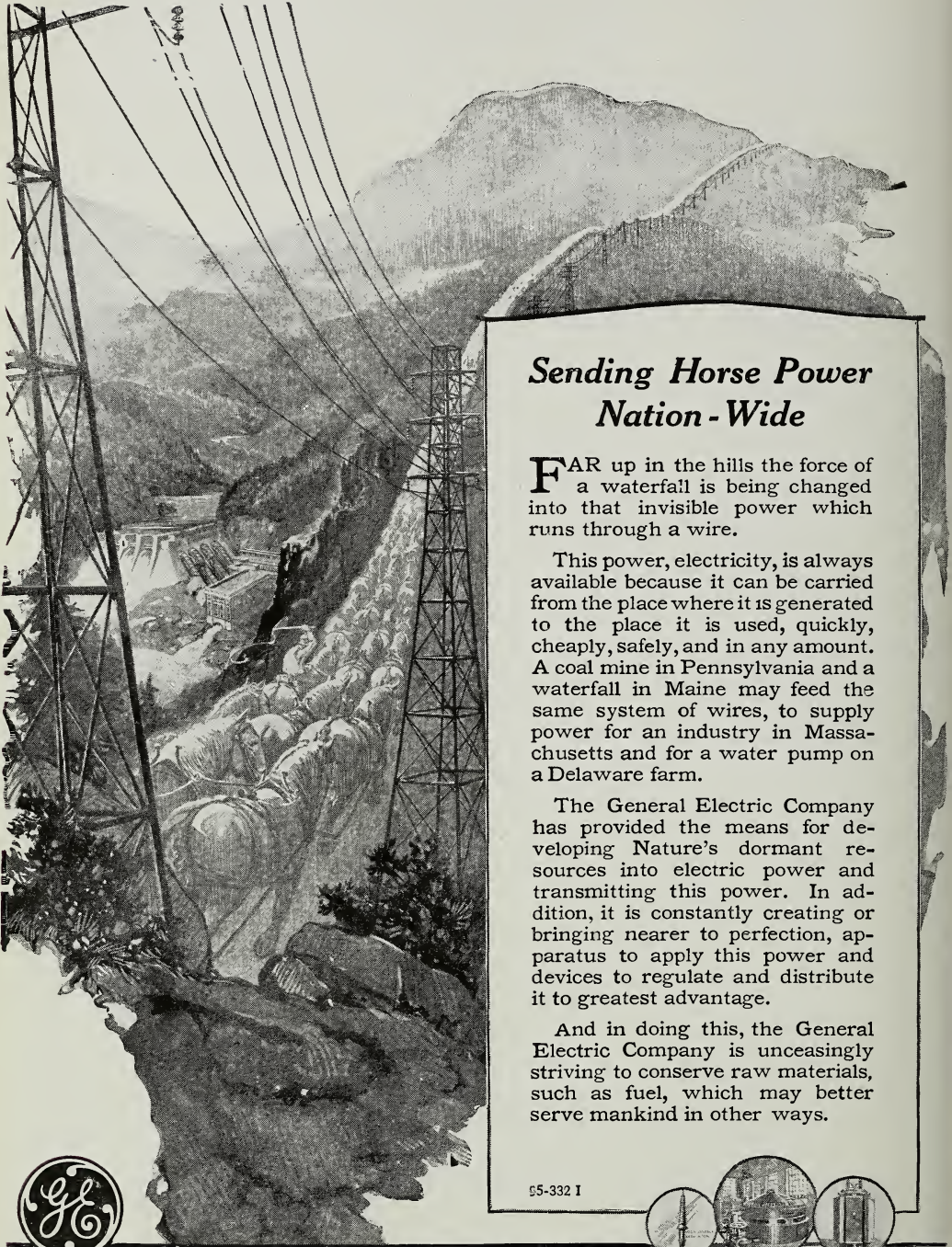
THE AGRICULTURAL STUDENT

OHIO STATE UNIVERSITY - COLUMBUS, O.

JANUARY 1921



All Roads Lead To Columbus
FARMERS' WEEK - JAN. 31-FEB. 4



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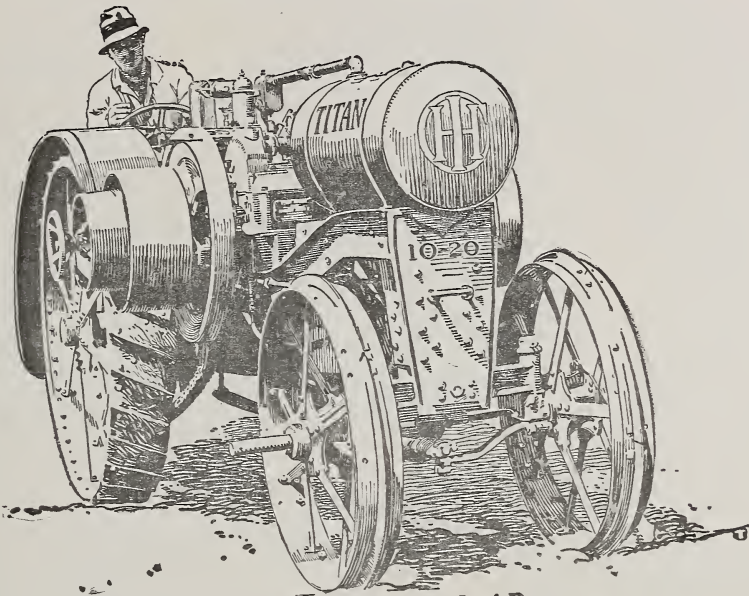
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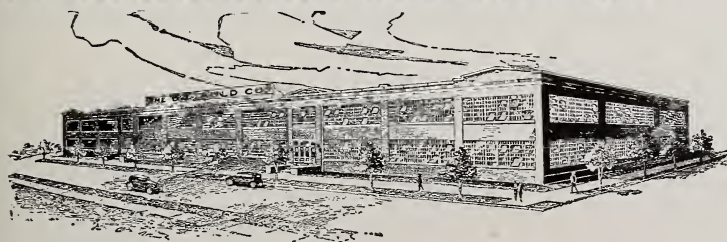
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Established 1893.

Published by the Students in the College of Agriculture.

Subscription Price, One Dollar and Fifty Cents the Year.

Entered at the Postoffice at Columbus, Ohio, as Second-Class Matter.



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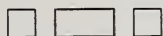
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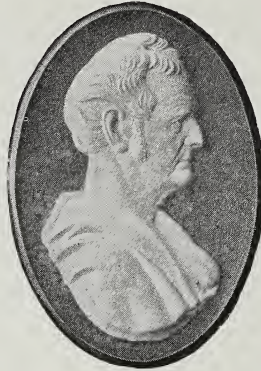
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NOTICE TO ADVERTISERS AND READERS

Our readers' attention is called to the fact that our publication refuses to publish all questionable advertising and that any advertisement found in our pages carries with it the good will and recommendation of those who are devoting their lives in definite fields of study that will aid in the development of progressive agricultural interests.



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 You've got to keep on walking;
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The Agricultural Student

VOL. XXVII

OHIO STATE UNIVERSITY, COLUMBUS, OHIO, JANUARY, 1921

No. 5

THE CARE OF THE BROOD SOW IN WINTER

By PROF. J. S. COFFEY.

(Prof. Coffey, of the Animal Husbandry Department, is particularly interested in swine production and management. He gives some very practical and beneficial ideas in this article on the care of the brood sow.)

OF all females, among farm animals, the brood sow is the busiest providing all of her time is occupied as it should be. The calls upon her vitality are strenuous, and unless she is given the best of care at all times, poor results are sure to occur somewhere along the line of a year's events. To show just how busy a good-producing brood sow really is, there is given below a table of events occupying a period of a year:

1. The sow is bred November 21. She passes thru a 16 weeks' gestation period.
2. She farrows March 15. She passes thru an 8 weeks' suckling period.
3. The pigs are weaned May 14. The sow receives two weeks' rest.
4. She is re-bred on May 21. She passes thru a 16 weeks' gestation period.
5. She farrows September 15. She passes thru an 8 weeks' suckling period.
6. The pigs are weaned November 14. The sow is given one week's rest.
7. The sow is again bred November 21.

A casual observation of this table shows conclusively that the brood sow loses little time in the period of one year. In fact, her vacation is made up of a total of 2 weeks, one at each of two separate intervals in the year. At all other times the calls upon her strength are heavy and often devitalizing. Her

own body functions must be maintained and at the same time she must give herself up to the building of new tissue in the form of the developing foetus or the suckling litter.

Only the essential points of the management and feeding can be covered in an article of this sort, and the writer therefore selected the winter season as the time being uppermost in the minds of sow owners.

The winter season of 1919-1920 was disastrous to sow owners over a major portion of Ohio. Many old-timers claim that in all of their experience they had not observed as many litter losses and poor results generally at farrowing time. It is now time to give some thought to the present winter season and to avoid if possible a repetition of last year's unsatisfactory results.

To begin with the management of brood sows in the winter, it may be said that mature sows may conveniently be kept together in groups not to exceed 10 or 12 animals. To go beyond that number, owners may experience some difficulty due to sows piling up with injury resulting to the weaker members of the herd. If possible the sleeping quarters for the sows should be so arranged as to force exercise upon the sows. By this is meant, the separation of feeding and sleeping quarters at such a distance as to require considerable travel upon the part of the sows daily

in going to and from their feeding quarters. Another method of inducing exercise with sows is to scatter their feed over considerable ground, thus causing them to move about freely in picking up the feed.

At any rate exercise is imperative. There is little doubt that many of the unfortunate experiences of last winter were due to the fact that many sows were poorly exercised. It will be recalled that cold weather of last winter was of long duration, and that most of the time the ground was solidly covered with ice. These combined conditions were effective in keeping the sow close to her warm bed, and as a result she came up to the farrowing time in poor condition.

The quality of the sow's ration is another point of great importance. It is the writer's opinion that the quality of the sow's ration is of far greater importance than the quantity. True it is that an extremely fat sow is not desirable at farrowing time. However, the point is this—that if feeds are properly selected there is small likelihood of her eating enough of them to cause her to become unduly fat.

The feeds that are best for the pregnant sow during the winter months are feeds bulky in nature. Such feeds as alfalfa hay, mangel-wurtzels, and clover chaff, are excellent. Too often feeds of this nature are left entirely out of the sow's ration and in their stead she is fed heavily on an exclusive ration composed entirely or largely of corn. As the result of a too restricted grain ration, the foetus does not develop normally, the sow is not in the best of condition for farrowing, and often many pigs are still-born or weak and unable to nurse.

The grain part of the ration should

not be too abundant and should be nitrogenous in nature. A grain ration composed of equal parts of corn and middlings, or corn 6 parts, tankage 1 part, or ground oats 5 parts to 1 of wheat middlings, makes a splendid grain feed for the sow.

For a week previous to the time of farrowing the feed should be reduced in amount and made laxative in nature by the addition of bran or oil meal to the grain part of the ration. The reason for cutting down the amount of the ration is to reduce the possibility of a too heavy milk flow when the pigs are born. Too much milk may be the cause of digestive disorders with the pigs, and as a result losses will occur. Laxative feeds have a cooling effect on a feverish condition. The sow at the time of parturition shows considerable fever and blood congestion. Therefore any treatment which will dissipate these conditions is desirable.

The sow immediately after needs no feed. In fact it is desirable to permit her to remain quiet for a period of 12 hours or more. In case she appears restless due to hunger, a gruel made of warm water and middlings will allay the hunger and cause restlessness to cease.

In conclusion on the winter management of the brood sow, let these salient points be kept in mind:

1. See that the sow procures an adequate amount of exercise.
2. Furnish the sow with palatable, bulky, and succulent feeds.
3. Be sure the grain part of the ration contains sufficient protein.
4. Reduce the amount of feed just previous to farrowing and at the same time add feeds to the ration which are laxative in nature.
5. Do not feed the sow just farrowed for a period of 12 hours or more, unless she is restless due to hunger.

AGRICULTURAL NEWS AN IMPORTANT FACTOR IN EXTENSION WORK

By J. E. McCLINTOCK, Extension Department, O. S. U.

THE common conception of agricultural extension work is that of work done in the field: (1) by extension specialists thru farm visits, field meetings, demonstrations, lectures, and correspondents; (2) by county agricultural agents, home demonstration agents, and boys' and girls' club workers thru similar channels; (3) by the farmers' institute lecturers; and (4) thru the distribution of bulletins and correspondence courses. These four groups of agricultural extension agencies have been generally recognized for several years, some of them for many years. However, the Smith-Lever Act, passed by Congress May 8, 1914, and which has stimulated agricultural extension work in a national way, states "That cooperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, not *imparting* to such persons information on said subjects thru field demonstrations, publications, and *otherwise*."

In the writer's opinion, one of the very effective "*otherwise*" means of giving instruction in agriculture and home economics is thru the press, that is, the weekly and daily papers. Not, however, by using the press as a means of spreading propaganda or by space grafting, but by giving to the press honest to goodness news concerning events pertaining to the farm and the home and especially of farms and homes in the community covered by the paper in question. In other words, give the editor local news stories. He wants

them and will welcome all such that reach his desk. It is only reasonable that such should be the case, because there are in Ohio several hundred weekly and small daily newspapers one-half of whose subscription lists is composed of rural folks. If this is the case, those subscribers who are interested in the country and farm affairs are not only justified in expecting but should demand that the papers carry news pertaining to the country.

HOW CAN THIS NEWS SERVICE BE RENDERED?

At the present time the Agricultural College Extension Service is employing, among others, more than 20 subject matter specialists, about 70 county agricultural agents, and half a dozen or more home demonstration agents. The specialists during the course of a year visit hundreds of communities, conferring with the county agent and addressing meetings. The county agents and the home agents spend their entire time conducting demonstrations, holding meetings, and in other ways working for the farming and home interests in their respective counties.

To take a specific case, a county agent arranges to have a poultry culling demonstration in his county as a part of a campaign by the County Farm Bureau to oust the scrub hens from the county. Mr. Dakan, the poultry specialist, is present and gives a demonstration of culling out the non-laying hens before 50 persons, each of whom may have learned how to do the culling. By such a method it takes a long time to cover a county.

In one such case in Auglaize County

the editor of the Minster Post aided materially by running the following story which announced two meetings and reported briefly what was said at another one.

As part of a campaign by the county farm bureau to oust the scrub hen from the county, two local culling demonstrations are to be held Monday, August 9, in this vicinity. One will be held on Joe Roettgerman's farm at 9 a. m., and the other at Ben Eiting's at 2 p. m. Everyone interested in poultry is invited.

At a poultry culling demonstration last Friday at Louis Watterman's residence in New Bremen, Prof E. L. Dakan of the Ohio State University said, "Of the 259,000 hens in Auglaize County, half of them should be culled before September 1. It will be six months before these scrubs will lay again, and it costs 25 cents a month to keep them. Poultrymen will therefore pay over \$194,000 to maintain them before they start again to pay for their keep.

"Cull the hens that normally molt early. Those that have been good layers and have been eating an abundance of food will have a white vent, white beak, and white legs in the fall. In order to lay eggs, a hen must have a supply of animal food such as meat scraps, tankage, or milk."

The Minster Post is a small weekly paper reaching probably 1,000 subscribers almost all of whom as a result of this short story will become more or less interested in more profitable poultry and interested in the culling meetings held in that county. This is an example of how the work of a specialist can be greatly aided if not multiplied many times by use of a short agricultural news story.

Here is another story which was run in the Farm and Dairy of November 5, 1920:

LIME IS GOOD CLOVER INSURANCE

A convincing demonstration that lime is essential to secure a good stand of clover may be seen on the farm of C. F. Kreitler, County Farm Bureau president, Lordstown township.

Last year for the first time, two tons of ground limestone to the acre was applied to six acres of an 11-acre field of corn. The other five acres were left unlimed owing to inability to get it. In the fall the field was seeded to wheat, and 200 pounds of acid phosphate was drilled in

with the seed. Last Easter six quarts of clover seed was sowed to the acre of the entire 11-acre tract. A mixture of two parts red clover to one of alsike clover was used. The wheat yield this season was 20 bushels per acre. Little difference was noted between the limed and unlimed portions of the field. But since wheat was harvested, a rank stand of clover has developed on the limed part, and a very scant stand on the unlimed part.

On the unlimed land a much larger proportion of the alsike than the red clover is found. This bears out the statements of soil specialists, who say that alsike clover will grow on soil with a lower lime content than that required for red clover.

Because he got fair stands of clover occasionally, Mr. Kreitler formerly did not believe that lime was necessary on his farm. He used for the first time in 1911, when his son Charles returned from a course at the College of Agriculture at Columbus. At his son's suggestion three tons was applied to a strip of clover land, a luxuriant stand of clover was secured on it, while little was obtained on the rest of the field.

In view of these demonstrations, Mr. Kreitler is convinced that lime is a profitable insurance against a clover failure.

This story has that human interest quality that is so desirable in any news item, carries information, and places a lime demonstration before Trumbull County farmers in a way that makes the reader feel that he had visited the field and that lime is essential for good clover crops.

The field for the development of stories of the kind given here is practically untouched. They could be used in connection with every lecture given and demonstration made on a subject pertaining to the farm or the home. By them the meat of such lectures and demonstrations could be carried to thousands where otherwise hundreds only are reached.

The Agricultural College Extension Service has one man who can devote probably one-fourth of his time to writing these news items. As a result several hundred of the stories have been given to the press and in each case the editor has received his story with thanks.

FARMERS' WEEK

By FRANK C. DEAN.

(This article contains detailed official information about Farmers' Week.)

FOR the ninth time the Agricultural College Extension Service of the University is inviting the farmers of Ohio to a week's program of information and inspiration of the University at Columbus.

Farmers' Week, as this occasion has become known to rural Ohio, will be held from next January 31 to February 4.

The same general plans which have proved to be popular in previous years will be followed again this year.

A program of lectures and demonstrations offered by 150 speakers has been arranged. Among them, in addition to the workers of the college and experiment station, are a number of successful farmers and specialists of outstanding ability from many states.

The Ohio State Corn Show, will be held in the Armory thruout the week. In addition to the usual cash prizes, several trophies are to be awarded. The county farm bureau whose members win the most premiums will be awarded a handsome silk banner.

HOME CONVENIENCE SHOW.

An exhibit of water supply and farm lighting systems will be made by the Agricultural Engineering Department. The apparatus will be tested for efficiency much the same as the tractors have been in previous years. The domestic engineering laboratory containing laundry apparatus and other household labor saving equipment will be in full operation.

On the animal husbandry program, Monday will be dairy cattle day; Tuesday, sheep day; Wednesday, horse day; Thursday, swine day; and Friday, beef

cattle day. A cattle and horse show and judging demonstrations of different classes of livestock will form parts of the program. In addition to faculty members, the following speakers will be on this program: Peter Small, Chesterland; W. A. McKerrow, University of Minnesota; Dwight Lincoln, Milford Center; J. F. Walker, Gambier; Col. Robert McEwen, London, Ontario; Walter F. Handschin, University of Illinois; E. L. Shuey, Springfield; W. H. Pew, Ravenna; John Evvard, Iowa State College; James Poole, Chicago; Kenneth Ikeler, Granville; Dr. Leonard Goss, Kansas State Agricultural College.

On the crops program, Monday will be given over to a discussion of sweet clover, Tuesday to soybeans, Wednesday to crop rotation and special forage crops, and Thursday to better seeds.

O. H. Anderson, Paulding; E. E. Basil, Haviland; Jacob McQueen, Baltic; W. D. Zinn, Philippi, West Virginia; E. J. Johnson, Stryker; L. P. Mark, Westerville; L. F. Graber, University of Wisconsin; and William McD. Stone, Atwater, will be among the speakers in addition to college and station workers.

Prominent out-of-state men on the soils program will be Emil Truog of the University of Wisconsin and Frank I. Mann, of Gilman, Ill.

The women's program, which annually attracts several hundred farmers' wives and daughters, will be given as usual. Mrs. Ruby Green Smith of Cornell University is to be one of the prominent speakers from outside the state.

(Continued on page 238)



OF

OHIO STATE UNIVERSITY

A Medium for Exchange of Ideas Between College and Farm

EDITORIALS

FARMERS' WEEK

All roads lead to Columbus according to our cover page, drawn by C. E. Wilson of our Extension Department, and this is decidedly true. When we think of the large number of farmers who came last year, we naturally believe this. Indications, this year, point to a banner attendance. One point in particular we must keep in mind, and that is to come prepared to stay over for the National Tractor Show, the week following. This is an educational and not an advertising feature, and therefore we believe it should be patronized. Everything is free, so "come."

THE COUNTRY CHURCH

Throughout the rural sections, a condition has arisen which forms itself into a serious problem. The decadence of the church in some communities, as shown by various rural surveys, is sufficient evidence of this. However, other questions arise concurrent with this, as, how to fill the country church, should the country churches combine, and what kind of a "sermon" is wanted. In many sections of the country abandoned churches have been found. This is due to lack of support in most cases. Efficient preachers are very scarce when it comes to filling rural vacancies. This is due partly to small salaries and limited chances for advancement and partly to the fact that preachers who understand rural life and who are thoroughly in sympathy with the people are not available.

As to preaching agricultural subjects, that is for the farm specialist. Even the farmer craves spiritual food, and he must be fed. Furthermore to combine churches is in most cases not practical. The truth of this statement is borne out by the recent failure of the Interchurch Movement. When we think

that the Methodist and Baptist do not care to unite, what can we think relative to Protestant and Catholic?

The whole problem therefore resolves itself into one proposition, which is, that each denomination must face its condition separately. A correspondent to *The National Stockman and Farmer* solves the problem as follows:

"How many country pastors are paid a salary commensurate with the following specifications?—Understanding of practical farming. Leader in every line of thought. Ability to make personal friends of the whole community and willing to feel themselves partly responsible for their methods of living. Skillful ball-player, tree-pruner, and able to be a wise leader of a farmer's club. A gentleman who has been tamed by the music in the trees, the ripple of the stream, the warble of songsters, and the majesty of the storm. A man who can see God's hand operating in the soil, plants, trees, and animals; who can see 'tongues in trees, books in running brooks, sermons in stones,' and good in all nature, and who has absorbed bravery, manhood, and culture from thought on it. These are some requirements, but no other kind is fit for a country pastor.

"The country pastor must know the Bible as it applies to farming. The Book is full of agriculture, and any preacher who is deficient in it will make some blunders. For example, we have some hymns on record. A real good, well-meaning Christian was moved by 'passing under the rod' to devote some victim to severe chastisement by the way of consumption, death, etc., not knowing that the shepherd's rod is for help, encouragement, and protection. Another tried his hand in a jingle on 'Take my yoke' and made it an emblem of captivity and sacrifice when a farmer's boy knows a yoke is for comfort and efficient service and that the old cattle will walk up to have it put on. Much of the best of the Book is a sealed letter to the person who is a stranger to farming.

"The man I recommend will build up the rural church. He will cost at least \$2,000 a year also, but he is worth it, and it will be no mistake to get him. It will take some 'loosening' up to pay that, but a good many farmers have been putting money in wildcat stocks that should have gone to a minister. Such a man will pay 100 per cent on the investment yearly in your increased success and uncountable gain in comfort, in holding the youth and in practical religion. You will never be ashamed of him and he will not need to shake hands sheepishly and 'silently steal away.' This is a heroic prescription to men who have been paying a few dollars a year or none, but it is the only salvation of the country church."

HOW TO LIVE

As January the first rolls around again, New Years resolutions are again in order. The average resolution is soon forgotten; however, we find a real thot and excellent possibilities in these words from Bryant's *Thanatopsis*:

"So live that when thy summons comes to join
The innumerable caravan, which moves
To that mysterious realm, where each shall take
His chamber in the silent halls of death;
Thou go not, like the quarry slave at night,
Scourged to his dungeon, but sustained and soothed
By an unfaltering trust, approach thy grave
Like one who wraps the drapery of his couch
About him, and lies down to pleasant dreams."

FARMERS' DAY

A. P. Sandles, secretary of the National Farm Congress, has suggested that we have a National Farmers' Day. Most of the States have a Farmers' Week, but all the farmers are unable to take advantage of this. It is therefore a timely suggestion.

Undoubtedly the farmers are entitled to such, and could use it to advantage. The farmer's wife, we believe, will stand ready to endorse this plan. The constantly growing problems that perplex the farmers in various communities could be discussed, and a general "get together" program could be followed in such a way as to bring about a closer friendship, and a more united effort in behalf of the common good.

SOILS

W. E. KEYSER, Editor.

TIMELY SOIL TOPICS

Straw Utilization—It requires 110 pounds of wheat straw and 70 pounds of oats straw to carry one bushel of grain. Ohio produced for the ten year period—1909 to 1919—three and one-half million tons of straw. Of this amount Western Ohio probably produces two-thirds, and Eastern Ohio the remaining third. Is there any plant food value in this great tonnage of straw? According to the Experiment Station at Wooster the constituents found in one ton of wheat and oats straw, respectively, are: nitrogen, 10 and 11 pounds; phosphoric acid, 4 pounds each, and potassium, 20 and 26 pounds. Or the annual amount of plant food constituents held in the straw is 36,500,000 pounds of nitrogen, 14,000,000 pounds phosphoric acid, and 80,500,000 pounds of potash. And yet we are prone to regard straw as a produce with but little value as a carrier of plant food. It will be noted that straw carries considerable nitrogen and potash, especially the latter. Approximately two-thirds of the nitrogen and phosphorus are concentrated in the grain.

How is this great tonnage of straw being utilized? Some farmers feed straw, some use it for bedding, others sell it and still others allow it to accumulate from year to year in large unsightly piles here and there on some out of the way corner of the farm. Straw should not be allowed to lay in the open yard any more than manure. Work the straw thru the stables or scatter it over the fields at once. It is a questionable practice to sell straw unless

the price justifies it and it is returned in the form of a commercial fertilizer. Top dressing of wheat is a good practice. A ton of straw spread over one acre have increased the yields from two to five bushels to say nothing of the protection of the new clover seeding.

Besides the plant food constituents straw adds organic matter to the soil. This promotes good tilth. This is a problem to think over for this waste can be avoided. Imagine the amount of plant food lost if the practice of leaving the straw stand in unsightly piles was continued for a period of from fifty to seventy-five years.

PHOSPHATED MANURE

The reinforcement of manure with phosphorus should be a common practice on the average farm. No other single practice will increase crop production, save labor and increase profits as this method. The common practice has been to apply the two separately. According to statistics as an average there are available in Ohio one and a half tons of manure for each acre each year. Of course many acres receive no manure application during a generation of farming, while several acres receive much more than the average. In a test at the Experiment Station eight tons of manure every three years failed to produce maximum yields or profits.

So striking is the use of phosphates that many farmers rely entirely upon it, regardless of that fact that it furnishes no nitrogen or potash. In time this method will prove unsatisfactory. Experiment has proven that while

manure and phosphate alone increase yields the two ingredients together increase yields far greater. Over a period of twenty years at the Wooster Station the combination was 50 percent more efficient than manure alone. In manured soils, insufficient amounts of phosphorus to available nitrogen is indicated by shriveled grains. Manure alone is extremely low in phosphorus. Then some commercial form of phosphorus should be added. It may be added in the form of bone meal, basic slag, or acid phosphate. Either the floats or acid phosphate may be used, but experimental evidence in Ohio slightly favors the use of acid phosphate. At least 200 pounds per acre per year should be used. Larger proportions are justifiable. Valuable time is lost in using a spreader to sow phosphate or to scatter along the row. So it is best to add the phosphate to the manure while it is still in the gutter, or spread it on the manure in a covered yard, but never in an uncovered yard because of leaching. This would be a very insignificant increase in the farm routine.

Director Thorne defined "Phosphated Manure" as manure to which 40 pounds of either rock or acid phosphate have been added. It is a problem of profits or how much and in what way can manure be reinforced by phosphates to the best advantage.

FARMERS' INSTITUTES

Thruout Ohio there are being held 352 regularly scheduled Farmers' Institutes for the purpose of discussing topics of vital interest to the farmer of today. The institutes of 1919-20 reached 375,000 people. Some of the most vital problems that confront the farmer today are those pertaining to

the soil. To increase the yields we must understand our own individual soil and its requirements. Take your soil problems to the institutes with you for the round table discussions. The speaker may drop a thought which may be of great value. Several speakers are well informed on soil topics. Obtain a list of their subjects and request them to give these talks. The topic of soils should interest every wide-awake farmer today.

The colloids in soils have been found to be a very important factor, in regard to plant food and soil structure.

FARMERS' WEEK

The annual Farmers' Week held at the Ohio State University will again assemble January 31, February 1, 2, 3 and 4, 1921. This is a week in which the time could be well spent at the University Campus. No other session better offers the opportunity to hear some of the most outstanding authorities of Agriculture.

The soil is the medium for the beginning of all agriculture. The part of the program devoted to the study of soils is:

The Anatomy of the Soils and Its Relation to Crop Production—G. W. Conrey, Professor of Soils of Ohio State University.

More Wheat—Director C. E. Thorne, Ohio Experiment Station.

The Phosphorus Problem in Ohio Farms—Dr. F. E. Bear, Head of the Department of Soils, Ohio State University.

Natural Vegetation as an Indicator of Crop Possibilities—A. E. Waller, Professor of Botany, Ohio State University.

(Continued on page 238)

OHIO STATE AT THE INTERNATIONAL

By PAUL E. HAAG, '23.

THE 1920 International Livestock Show is now history. Every passing year sees this show getting larger and larger. More exhibitors showed stock this year than ever before. In fact, many did not even have a chance to show their stock as the places were filled early by private exhibitors, universities and agricultural colleges. Fortunately Ohio State's entries were made early, and although we might have had better results than we did, we were fairly successful and well satisfied with the showing made by our stock.

In the cattle show Ohio State was represented only in the special classes, the stock shown being Angus and Short-horn crosses. In the special class of steers or heifers calved between September 1, 1918, and January 1, 1919, we received second placing on Ohio's River and fourth on Ohio's Sweetness. In the open class for steers or heifers calved between January 1, 1919, and September 1, 1919, Ohio's Rare Boy won fourth place. This steer also took third place in the special class for the best crossbred from a Shorthorn sire. Ohio's Catherine, another crossbred, won fourth in the open ring for steers or heifers calved between September 1, 1919, and January 1, 1920, and second placing in the special class. In this special class Ohio's Rob Roy was a close third.

In the Herd of Three Head class owned by one exhibitor and consisting of one senior yearling, one junior yearling, and one calf, our herd took second place in the open ring and first place in the special class. For the class of three steers, spayed, or martin heifers calved since September 1, 1918, and the get of one sire we received fourth plac-

ing. This last class was open to all purebreds, crosses, and grades and was exceptionally large.

The placing of the Sheep was much more satisfactory from the viewpoint of the Ohio State supporters than were the placings of the cattle, as a yearling grade wether won the Reserve Grand Championship of the Show. Further placings of the sheep belonging to Ohio State University are as follows first in yearling wethers; second in pen of three yearling wethers; champion wether in grades and crossbreds; second and third in long wool grades and crosses.

In the Clay Robinson specials, with all purebreds, grades, and crosses competing, Ohio State's entry won first placing on yearling wethers. This wether was the Champion of the Clay Robinson specials.

The competition among the Swine seemed to be keener than in the other departments, due no doubt to the large numbers of high class stock in all the competing classes. In the Breeding Swine Division, our large Yorkshire entries won first on aged boar over 2 years; second on aged sow over 2 years; second on sow over 18 and under 24 months; first and second on sow over 12 and under 18 months; second on boar and three sows over 1 year; and second on herd which were the get of the same boar, and bred by the exhibitor.

The Judging Team, which consisted of five men and one alternate, also helped to uphold the standard set by the Agricultural Department of this University. The team won sixth place, the Purdue team being first with a lead of about 200 points over Ohio. The

team consisted of the following men: C. T. Condon, P. E. Heim, D. T. Herman, V. C. Decker and J. H. Knox, with H. A. Zollinger as alternate. Professor D. J. Kays was coach of the team and it is to his credit that the team won sixth place, considering that there were twenty-one teams competing in the judging contest.

Taken as a whole Ohio State was very successful at the show and with the continued improvement of our livestock, and as good, if not a little better teamwork on the judging team, we are looking forward to a more successful season at the International Livestock Show next year.

Peppy Pointers

By Powers.

Old Doc Wright says an ounce of pep is worth a pound of pepsin.

Out West liquor was found sewed up in the hem of a woman's skirt—a nip-and-tuck affair as it were.

Leaves are falling from the trees,
Falling, too, are B. V. D.'s.
Kind a chilly 'round the knees,
Days like these.

Misery likes company. That's why both feet hurt when you are breaking in a new pair of shoes.

When you play, play hard; when you work, don't play at all.—Theodore Roosevelt.

There is a 50 percent increase in the number of students taking journalism at the University of Minnesota this

year. Judging from Minnesota's season of football defeats, the students would rather write about the game than play it.

The eleventh commandment: Thou shalt not kill—time.

Some defeats are only installments of victory.—Jacob A. Riis.

A Canadian agriculturist has invented a system by which the queen bees are developed in a cage to insure that they shall not get away from the control of the grower.

Let's beat our swords into something other than plowshares. We already have more plowshares than plowers.

On mules we find two legs behind,
And two we find before;
We stand behind, before we find
What the two behind "be-for."

The Kansas Agricultural College plans to supply daily weather forecasts to farmers in Kansas by means of wireless telegraph.

The winter girl adorns the town,
Prepared to melt or freeze.
She's Arctic from the collar down,
And tropic from the knees.

A short course in practical agriculture is offered students sixteen years or older at the University of Idaho. The course will run for five months and its purpose is to encourage such students to return to the farm.

God be thanked, whate'er come after
I have lived and toiled with men.—
Rudyard Kipling.

VOCATIONAL AGRICULTURE BOYS' AND GIRLS' CLUB WORK, ETC.

E. B. BARKER, Editor; J. A. MALICK, Assistant.

AGRICULTURAL EDUCATION

Vocational teachers are gradually entering upon a new field with profit both to themselves and to their departments in the publicity that is afforded. The means employed is that of contributing to farm papers items of interest or stories connected with the practical results secured in the promotion of vocational instruction in Agriculture. Contributors whose articles have recently appeared in the farm press are: Thos. E. Berry, Hillsboro; Harry Atwood, Hilliard; Wm. F. Bruce, Lockbourne; M. L. Jordan, Bloomville; E. W. Budd, Chagrin Falls. The papers publishing contributions have been the Breeders' Gazette, The Ohio Farmer, The Indiana Farmers' Guide, the National Stockman and Farmer and The Agricultural Student.

The next event in the state-wide competition among vocational departments is the Corn Show of the Ohio Seed Improvement Association which will be held in connection with Farmers' Week. The officers of the association have arranged this year for two special classes in Dent corn for entries from vocational departments only. Each department is limited to five entries in each class, the classes being ten ears of yellow Dent corn and ten ears of white Dent corn. To secure the exhibits from each department a local corn show is held in which all eligible members of a department make entries. It is probable that a great majority of the vocational departments will hold local shows to de-

termine their entries for the state show. With a good response this year it is possible that increased premium money will be available in later years and that a larger entry classification may be provided.

Following the success of not less than fifteen winter short courses conducted last year, a large number of the teachers are arranging for similar courses this winter. These short courses are usually held during January and February and consist of work especially adapted to those farm boys and young men who are able to take advantage of the instruction in Agriculture during the slack season on the farm. Local conditions vary the scuring of an enrollment and the length of course very materially, but where the organization of a course is possible highly satisfactory results are usually obtained.

At the annual meeting of the Ohio State Teachers' Association which was held in Columbus, December 28 to 30, the vocational teachers held a sectional meeting for which a strong program had been prepared. Out-of-state speakers were C. W. Watson, State Supervisor of Agricultural Education in Nebraska, who spoke on "Farmerizing Agriculture" and "Home—Project—School," and Professor L. M. Roehl, Professor of Farm Shop Instruction in Cornell University, whose subjects were "The Place of Farm Shop Instruction in Our Schools" and "The Organization of a Course in Farm Shop." Other

speakers were Vocational Director Brady of Columbus, Superintendent Weiser of Canal Winchester, whose subject was "How the Vocational Department Functions in the School System," and Professor Fife of the Department of Agricultural Education. Vocational teachers who made contributions to the program were D. G. Swanger of Wellington, who spoke on "Measuring Results in Vocational Teaching;" H. W. Walter, Gallipolis, whose subject was "The Vocational Teacher and Community Work;" Thos. E. Berry, Hillsboro, who presented "Methods of Increasing the enrollment," and M. L. Jordan, Bloomville, who gave ideas on "How a State Live Stock Judging Contest Should be Conducted."

Messrs. Clever and Everhart recently finished their practice teaching. Mr. Clever taught at Hamilton Township and Mr. Everhart at Worthington. At the end of this semester they will be ready to be added to the Vocational Agriculture teaching force.

ELEVEN CLUB MEMBERS ATTEND INTERNATIONAL

Several counties in Ohio are so imbued with the good of club work that they are spending no little effort and money in promoting this sort of work when it has a real educational value. To this end four counties sent club winners to the International Live Stock Show at Chicago this year. Preble County sent the champion in the Calf Club. Champaign County sent four members of its Calf Club. Erie County sent its Pig Club champion. Richland County sent four champions—Pig, Food and two from Calf Club. In each case the expenses were paid by the County Fair Board except in the case of Richland

County, in which case the expenses were paid by the Shelby Community Welfare Society.

The delegation was chaperoned by Assistant State Leader Guy Dowdy.

Four hundred club winners from 25 States attended the show. The boys were quartered at the Y. M. C. A. Hotel and the girls at the New Southern. The youngsters were entertained by the Armour Company during the week. Various tours were made, including trips thru the packing plants, Art Gallery, Marshall Field's, International Harvesting Company, Argo Corn Products Co., Zoological Garden, and the Stock Show proper. In addition to this some special entertainment was given by Swift & Co., Wilson & Co., and Morris & Co.

All in all the week was a great success. All the activities were strictly educational, and no county will make a mistake in sending two or three of the outstanding winners to this show next year.

Edwin Lohnes of Enon, Clark Co., has achieved the honor of being the champion corn grower of Ohio by producing 115.3 bushels of corn on an acre. This honor was announced at a banquet given by the Springfield Chamber of Commerce to all corn club members in Clark County who finished. In the afternoon preceding the banquet a county exhibit was held in the Farm Bureau office. Sixteen boys exhibited 10 ears each as a part of the season's work. The corn club work was judged on the four point basis and was graded on the basis of yield, profit, exhibit and story and record.

WHITE COTTAGE FOOD CLUB

A real live club, and plenty of club spirit is the result of a Food Club or-

ganization at White Cottage, Muskingum County, under the direction of Miss Esther Thompson. This Food Club was reorganized on May 1 of this year with 12 club members. This is the third year for a club group at White Cottage. Much of the inspiration of continuing the club has come from Helen Woodward, now a third year member. At the county exhibit held in connection with the county fair of Muskingum County in August, 60 percent of these club members made an exhibit of canned fruits and vegetables. Seventy-five percent of the club members finished the club work for this year, altho they were prevented from making an exhibit.

On December 3, a very interesting club meeting was held at the home of Anna Shiplett. The club officers presided at the beginning of the meeting. A program of music and readings was given by several of the club members. Verna Spring, who had attended Boys' and Girls' Club Week this year (Nov. 15-18) as a township winner, gave an interesting account of her trip and her week's experiences. Club games and club songs were sung during the meeting.

Following is a club song which was composed by the members of this live club group:

FOOD CLUB.

(Tune, "Mickey")

Food Club, peppy Food Club,
With your girls so brave and true,
With your cooks always leading,
And leader so charming,
Girls so alarming, too.
Food Club, peppy Food Club,
There's no other club like you;
In the future you'll remember
The wonderful club—
The club of W. C.

This club group will continue because it is made up of real, live young folks who are doing a good piece of club work and because a young woman who has a vision is the local club leader.

PLEASED WITH OHIO PROGRAM

G. H. Gehrand, Wisconsin state supervisor of agricultural education, recently visited the teacher training departments of Grove City and of Hamilton Township for the purpose of observing the Ohio plan for training teachers in vocational agriculture. While the guest of Professor Wilbur F. Stewart, of the department of agricultural education, Ohio State University, he expressed himself as being highly pleased with the program Ohio is developing.

THE BOY YOUR MOTHER THINKS YOU ARE

Here are some things, you will all agree,
That are worth a fellow's while to be,
That will bring success in the glad years
when

He will be one of the world of men.
Strong, courageous, with golden health,
This is better than fame or wealth—
Keen of vision, alert of brain,
Eager to labor with might and main.
To follow, with feet that will not tire,
The shining road of his heart's desire.
These are some things, you will all
agree,

That are worth while, but, heart of
youth,
Here is a thought as true as truth;
There is something more, that is better
far—

The boy that your mother thinks you
are!

—Farm Boys' Leader.

RELATION OF THE PASTOR TO THE TEACHER

By REV. O. L. BARKER, Claytonville, Ill.

STRICTLY speaking there is a close relationship existing between the pastor and the teacher. The pastor is a teacher and the teacher is in a sense a pastor, or at any rate he must be endowed with a great many traits of the successful pastor in order to be able to fill well his mission as a teacher. There are those who oftentimes entertain a misconception as to the work of a pastor. They seem to think that his work is strictly confined to the spiritual realm and that he has nothing to do with tangible things except to beg for money and impose upon the rights of his fellow men in general. There are myriads of people who if they had their way every pastor would be excommunicated, yet if they were to have their way in this respect the history of the past is enough to reveal the inevitable consequence. The pastor as well as the teacher in order to be successful must come down to the earth where the masses live and deal with conditions as they are. The traits of human nature are the same as a whole in any undertaking wherever the public welfare in general is at stake, whether it be in the school room or in the pew. The psychology of the human race is an established immutable principle and we have it for our consideration whether it is to our liking or not. The teacher or even the pastor is undertaking too much when he attempts to dictate an ethical code and expects all to follow as he has suggested, we are too human.

It is not enough to say that the teacher prepares those under his care for time, while the pastor prepares those under his care for eternity. If the teacher does not prepare those under his instruction for eternity along

with their other accomplishments he is one of the greatest failures conceivable. Not that he should go around with a long sanctimonious face, but just the opposite expression with a Christ-like life behind it, and he will be a power for good, morally and intellectually, if he is prepared for his job. The work of a good teacher lives many, many years after he is dead and forgotten and he will not be forgotten so soon either. Oscar Kuhns has expressed this fact in the following poem:

"He has passed away, but he has left behind
A store of memories, that, in the mind
Of those who loved him, ne'er forgot shall be.
We think of those dear, far off days, when we
Sat at his feet, our teacher and our friend,
And felt the influence that ne'er shall end.
We see his kindly face, we hear his voice,
We feel the charm that makes our hearts re-
joice.

Oh, in the days and years that are to be,
More precious still shall grow his memory,
Beloved teacher, he who turned our eyes
Toward the beauty that around us lies!
Long in the lives of others shall go on
The work he did, though he himself be gone."

South also seems to have had a keen conception of the ideal which is within reach of every teacher and pastor; he has expressed it thus:

"He that governs well leads the blind;
but he that teaches gives him eyes; and
it is glorious to be a subworker to
grace, in freeing it from some of the
inconveniences of original sin."

The teacher comes in contact with a greater number of people than the pastor does because there are a great many people and always have been who would have nothing to do with a minister, while those of school age are compelled by law to attend school, thus whole families are brought under the influence of the teacher. It is also true nevertheless that just a choice few attend our higher institutions of learning.

(Continued on page 238)

HOME ECONOMICS

DAISIE CHLOE CUNNINGHAM, Editor; LILLIE SWANSON, Assistant.

POSSIBILITIES OF THE FARM HOME

An Interview With Ross Crane

The architect and designer looked at me with pleasure as though he anticipated an enjoyable session—telling me about farm houses. "It is a favorite subject with me," he declared, "because I think that farmhouses are the true centers of home life and therefore should be given attention and consideration by artists and decorators."

Ross Crane, head of the Extension Department of the Chicago Art Institute, believes farm surroundings may be just as alluring as urban home settings. "In fact, they should be more so because country people use their homes more than city folks. In the evening when the city family goes to a movie or to a friend's home, the farmer's family is spending their evenings in their home. To keep our young folks happy in rural districts it is essential that we strive to brighten farm homes and make them more like the present-day city home," he said.

One of the most beautiful homes Mr. Crane has designed was patterned on an old English manorial house. "In fact the style of the most artistic homes is based on the style and pattern of early country estates in England," Mr. Crane stated.

The grounds about the home should be well kept, the fences should be kept in repair—bushes, shrubbery and trees should soften the harsh appearance of the lonely rural home sites. Mr. Crane pleads for bright, sunny exteriors. "Plant lilacs in your front yards," he suggests. "Shrubbery and hedges add

to the beauty of your farm yards. Farm dwellers have all in their favor to make gardens blooming and rich in beauty. To remove that feeling of desertion associated with so many of your farm homes—that should be the main desire of country dwellers," Mr. Crane said emphatically. On the whole, however, Mr. Crane finds Ohio farm sites very well tended and cared for.

Simplicity should be the keynote within the home. "There is no necessity to observe so rigidly the decree of fashion in choosing furniture. Buy the simplest and best. Then you will be safe for all time," he maintained.

The country living room holds charm for all when it is tastily furnished and cozily arranged. "One dominating tone and color should prevail. The fireplace should be aglow in the chilly and winter seasons. Home life should center about that fireplace," declared the promoter of the "Better Homes for America" project.

Color, light and cheerful atmosphere may be secured by a pleasing abundance of lamps with soft mellow shades and Mr. Crane advised the farm mistress to make use of all little novel touches that are fashioned to brighten homes within and without.

"Make the home livable" is the request so ardently voiced by the noted architect and lecturer during his recent lecture engagement in Columbus. While touring the country this winter Mr. Crane is assembling material for his book to be published in behalf of the "Better Homes" movement.

Marie Mirvis.

HOW TO CHOOSE

A BECOMING HAT

The task of selecting a becoming hat presents itself as a problem in color and a problem in design. To choose a becoming hat the wearer must have an appreciation of her own coloring, feature and build. If a hat is to be used for "general wear" a neutral color should be selected. While a bright red hat may be attractive and becoming it can be worn in combination with fewer other colors than black or dark blue, or dark brown models. Hats of neutral color however may often be brightened and made more becoming by using a touch of color as a trimming, or a colored facing.

As for design, care should be taken not to accentuate undesirable lines or features. This is often done by repeating in the hat a bad line of the features or an undesirable feature may be emphasized by using too strong a contrast.

The line of the crown should not extend beyond the hair at the back of the head, but should appear to be a logical continuation of these lines.

The small narrow face should choose a small hat. The narrowness is simply accentuated by the use of a high-pointed hat, because it adds to the apparent length of the face, while a very large hat by contrast makes the features appear smaller. If the face is large, the crown must be large enough to appear to cover the head. The round face wears a hat slightly turned up very well as this gives length to the features. A brim shorter in the back is also good as this type of person usually has a short neck. Soft full features may wear severe straight sailor styles, while the woman with hard angular features must select soft graceful lines.

The line of trimming is very important and the effect of a well and carefully chosen shape may be entirely lost by the use of poor lines of trimming.

When trying on hats stand before a full length mirror. Usually tall, slender people look better in large hats as these have a tendency to break the height, while short stout persons can better wear small hats which add to the apparent height. Have you ever noticed how close you really have to be to a person before you actually see their facial features? Try it on the street some day and you will then appreciate the importance of choosing your hat in relation to your entire figure as well as to the features of the face.

Miss Calahan.

Cut your speeches like a woman's dress—long enough to cover the subject, but short enough to be interesting.

To keep silk blouses white, always wash them in cold water. Make a good lather with soap and warm water, and allow this to get quite cold before putting the blouses into it; then to the rinsing water add just a little methyated spirit. Iron the garments while still wet.

To remove grease marks from books, sponge the soiled spots carefully with benzine or ether, and then put the leaf between two sheets of blotting paper and quickly pass a hot flatiron over it.

SPECIAL

—
**Home Economics
Number
February Issue**



*I find sweet peace in depths of autumn woods,
Where grow the ragged ferns and roughened moss;*

*The naked, silent trees have taught me this—
The loss of beauty is not always loss.
—Elizabeth Stoddard.*

THE CAMPUS ECHO

H. W. HAIRSHFIELD, Editor; MERRILL CONN, Assistant.

THE CROPS DEPARTMENT

The farm crops department has added a new member to its staff. Mr. Harold L. Borst from the University of Minnesota, who holds the title of instructor, will take charge of the crops experimental work. Mr. Dexter Lutz, who formerly held this position, is leaving for Korea where he will be engaged in agricultural missionary work.

The new men in the extension department are Earl Jones, class of 1912, and Earl Chenault, class of 1915. Mr. Jones is acting in the capacity of assistant professor and extension specialist, while Mr. Chenault is assisting in the ten acre corn contest that the extension department has been carrying on.

TO GIVE PRIZES IN

STATE GRAIN SHOW

A silk banner will be offered as a prize to members of the County Farm Bureau who receive the largest numbers of premiums at the Ohio State Corn and Grain Show, held here during Farmers' Week, Jan. 31 to Feb. 4.

The Ohio Millers' State Association offers a larger trophy for the sample of wheat that receives the highest score in the baking and milling contest.

Townshend Agricultural Society gave a dance Saturday evening, Dec. 4th, at Budd Hall. Thirty-two couples attended. A good time was enjoyed by all. Prof. Joel Coffey was chaperone

A FELLOWSHIP

Danna Coe has been awarded a fellowship to the University of New Jersey. In September Mr. Coe registered at the Ohio State University for a Master's Degree in the Department of Agricultural Chemistry and Soils. The fellowship is given by the American Cyanamide Company of Niagara Falls for the purpose of determining the availability of nitrogen in cyanamides for use in commercial fertilizers. The determinations are to be carried on at the University of New Jersey under the direction of Dr. Lipman. Mr. Coe obtained the fellowship thru the recommendation by the Bureau of Plant Industry of Washington, D. C. Mr. Coe is well known at the Ohio State University for he received his Bachelor's Degree in Arts-Agriculture at this school.

W. E. K.

STEWART PREPARES BULLETIN

Professor Wilbur F. Stewart of the Department of Agricultural Education has recently prepared a bulletin on "Vocational Agriculture in the High Schools," which is now ready for circulation. The bulletin is one of general information pertaining to the teaching of vocational agriculture.

DYNAMOMETER USED ON FARM

One of the four dynamometers in the equipment of American colleges is the property of the department of Agricultural merchandise here. This instrument is placed between

the tractor and its load and is used to record the total work of the tractor. It was used recently on the University farm to test a new high-speed plow which was loaned to the College of Agriculture by the Vulcan Plow Company of Evansville, Ind.

EVERY COUNTRY'S INSECTS FOUND IN CAMPUS BUILDING

Beetles, ants, moths, butterflies, dragonflies, houseflies and bugs—just bugs of a thousand different varieties and colors—make up the collection in the Botany and Zoology Building of Prof. James S. Hine of the Department of Zoology. The collection is used by students in comparing specimens to find out the species. It has belonged to the University for 10 years.

A. S. A. E.

The Ohio State branch of the American Society of Agricultural Engineers has been quite fortunate in obtaining speakers of importance and wide experience and command of their topics for the meetings of that society this year. The meetings have been well attended and great interest is being shown in the part which the society will take in the operation of the National Tractor Show.

At one meeting Charles Sprague, '19, addressed the society on the topic of fast plowing. Mr. Sprague was on his way to New York where he is to embark for China in the interests of the Standard Oil Company. He was formerly with the Cleveland Tractor Company in the capacity of extension expert, where he conducted many experiments on the speed of plowing.

Another meeting was addressed by W. J. Longbon, of the Ohio Moline Plow Co. and president of the Colum-

bus Tractor and Implement Club, who spoke on the history and aims of the National Tractor Show. At the same meeting Prof. F. W. Ives, of the Department of Ag Engineering, told of the part which that department would take in the National Tractor Show.

FACTS

Of the 7799 attending O. S. U., 1021 are in the College of Agriculture, Of this number 710 are men and 311 women. In addition 236 men are taking the three-year Agricultural course. In the College of Agriculture 73 men and 30 women were enrolled in the summer session. There are 213 men and 124 women or a total of 337 in the Freshman Agricultural class. Twenty-one men and three women are listed as special students.

OHIO STATE AT THE INTERNATIONAL

Not only did our judging team composed of V. C. Decker, C. F. Condon, P. E. Heim, D. T. Herman, J. H. Knox and H. A. Zollinger succeed in landing sixth place at the International Livestock Show, but our stock as well made an excellent showing. A yearling wether won the grade and crossbred championships and was also made reserve grand champion of the entire fat sheep show.

The hogs and cattle which were exhibited won placings from second to eighth. Ohio State' representation consisted of 5 head of cattle, 9 head of fat sheep, and 29 head of fat hogs. In all about \$500 was received as prizes.

FARMERS' WEEK

The 1921 Farmers' Week will, as usual have its share of good speakers.

(Continued on page 242)

SHORT AG. DEPARTMENT

J. V. Temple, Editor.

SENIOR CLASS MEETING

The Senior Class held a meeting Nov. 8, 1920, and along with the business taken up was the subject of class pins. It was agreed to adopt the design of the class of '20 and it is our request that this be the permanent emblem for the future senior classes of this course. A committee was also appointed to see if our commencement exercises could not be more than a mere banquet. The following officers were elected: J. V. Temple, President; C. J. Mattingly, Vice-President, and O. H. Mautz, Secretary-Treasurer.

REUNION

The Shorts Ags will hold a reunion Wednesday night during Farmers' Week. At this meeting we expect to have some very interesting talks by members of our alumni who are now the leading and progressive men of their community. All are cordially invited. Bring your neighbor if he is a Short Ag or not. Third floor, Ohio Union.

ATHLETICS

Short Ag athletics have taken on more form in the past two weeks and with the support of the Short Ag body it will be very successful. The facilities are of a minus quantity owing to two facts. First, not requiring a high school education the short ags are not eligible for any of the college activities, athletic or social, except in our immediate short course. Secondly, the facilities for gym work are limited because of the lack of space which cannot

be helped until the stadium is completed. So all the attendance therefore is voluntary and at a bad time. When the men do come out you can be assured they are out for business, and as they have been working on the farm they realize the need of exercise.

Thru the kindness of Dr. Nicholas we have been able to secure the gym floor from 6 to 7 on Tuesday and Thursday evenings.

We have at present two main sports with a coach for each, basketball, of course, being first. A fine lot of material has reported for this and there is no reason why a good team cannot be machined out. Besides the material, we have Mr. Lang of the varsity for our coach.

We expect to play several local teams and a few out of town teams. The out of town games are to help finance our equipment and activities.

Nothing can be said of the individual players as yet, but something of their merits will be said in a later article.

The next sport and a close second is boxing and as a coach for this we are very fortunate in having a member of our own course, Mr. Greniger, who has been instructor in the Cleveland Y. M. C. A. and at present is working at the local Y. M. C. A.

The rest of the work is as the individual chooses. All of the apparatus is at their disposal.

One thing is noticeable and that is the interest that is being taken when it is not compulsory and the men in the physical department are taking

notice of it. They have spoken very highly of the fact that the short ags are above the average in taking interest in the physical end of their activities—so all make an effort and interest your fellow student. You will never regret the two hours a week you spend in the gym.

FROM A STATE EXAM. FOR SCHOLARSHIP TO O. S. U.

Carbohydrates and fats are elements which produce quantity, while protein produces quality.

San Jose scale must be sprayed before blossoms open so as not to harm the ovaries.

San Jose scale may be found on the limbs of a tree where the bark is fitted together.

If I were building a walk I would first consider where to build it.

Building a concrete walk is much the same as preparing a seed bed.

Breeching is that part of a harness which goes over the breech of a horse.

Breeching is a part in a plow between the share and mouldboard.

Red clover is sown broadcast in the spring by means of a fiddle.

Timothy is sown with a fanning mill.

Jointer—used in cutting a crop at the joints.

The three chief constituents of a feed are water, alfalfa, and corn.

Poole—A cow that does not have horns from its birth.

Poole—The crown of the top of a cow's head covered with shaggy hair.

Pasteurized milk is milk from cows on green pastures.

Ayrshire, Merino, Elberta, Hampshire, Thorobred, Purebred, Poole, Earley Rose and Northern Spy are all types of sheep found in the U. S. A.; some are noted for their wool and others are noted for their butchering.

BE THE BEST OF

WHATEVER YOU ARE

If you can't be a pine on the top of the hill,

Be a scrub in the valley—but be
The best little scrub at the side of the rill;

Be a bush if you can't be a tree.

If you can't be a bush, be a bit of the grass,

Some highway to happier make,
If you can't be a muskie, then just be a bass—

But the liveliest bass in the lake!

We can't all be captains, we've got to be crew,

There's something for all of us here;
There's big work to do and there's lesser to do,

And the task we must do is the near.

If you can't be a highway, then just be a trail,

If you can't be the sun, be a star;
It isn't by size that you win or you fail—

Be the best of whatever you are.

—Cheer.

Father—So you broke five panes of glass in the greenhouse?

Son—Yes, father, I did it. I cannot lie.

Father—And when I'm through with you, you won't be able to sit either. Fetch that strap!

—o s u—

Johnny—Oh, mother, a lady talked to me in the park and gave me some candy.

Mother—That was nice. And what did you say?

Johnny—Oh, I said I wished father had met her before he married you.—
Utica Globe.

FARMERS' WEEK

(Continued from page 219)

A style show will be given by University girls.

NEW LECTURES BY DEAN VIVIAN.

The illustrated world tour lectures by Dean Alfred Vivian, which have been popular features during previous Farmers' Week programs, will be repeated but will consist of new material. One, for instance, will be a trip to European art galleries.

On Monday evening a concert will be given by the University Glee Club, on Tuesday evening, a concert by a rural chorus from Sunbury directed by O. F. Barcus and a lecture by President W. O. Thompson; Wednesday evening, a concert by Nell Bunnell-Smith; and Friday evening, motion pictures. The Thursday evening program has not been completed.

Following is a list of the different meetings of state agricultural associations to be held during Farmers' Week:

All Week—Ohio Beekeepers' Association.

Tuesday—Ohio Forestry Association, Ohio Sheep and Wool Growers' Association, Conference of Central Ohio Community Choral Association.

Tuesday and Wednesday—Ohio State Horticultural Society, Ohio Holstein-Friesian Breeders' Association.

Tuesday, Wednesday and Thursday—Ohio Farm Bureau Federation.

Wednesday—Ohio Poultry Association, Ohio Guernsey Association, Ohio Percheron and Belgian Breeders' Associations.

Wednesday and Thursday—Ohio Vegetable Growers' Association.

Wednesday, Thursday and Friday—Ohio State Dairymen's Association, Ohio Rural Life Association.

Thursday—Ohio Jersey Cattle Club,

Ohio Seed Improvement Association, Ohio Duroc Jersey Breeders' Association, conference of Farmers' Institute Workers, state federation of Farm Women's Clubs.

SOILS

(Continued from page 223)

Relation of Acid and Alkalines to Plant Growth—Professor Emil Truog of the University of Wisconsin.

How Much Limestone Shall a Farmer Use?—Professor Emil Truog.

The Intensity Factor of Soil Acidity—Robert M. Salter, University of West Virginia.

Illinois System of Soil Fertility—Frank I. Mann, Editor of the *Prairie Farmer*.

The Long Time Point View of Fertility Investigation—Robert M. Salter, University of West Virginia.

Fertility Practice on Bois D'Arc Farm—Frank I. Mann.

RELATION OF PASTOR TO TEACHER

(Continued from page 229)

In summing up this subject it is self-evident that cooperation between the teacher and pastor is most desirable and such united efforts on the part of both would prove a blessing to the church and the school. A misunderstanding always widens the gap of prejudice (if it may be called such) between the teacher and pastor which if put in the mildest form is unfortunate.

A certain amount of opposition is a great thing in any man's life. Kites rise against and not with the wind.

Noah was six hundred years old before he knew how to build an ark. Don't lose your grip.—Elbert Hubbard.

ARCADIAN

Sulphate of Ammonia

Quick Availability

Questions are sometimes asked regarding the speed of nitrification, or of the availability of **Sulphate of Ammonia**. Some, who have had no practical experience with this chemical, have been under the impression that the ammonia does not become available quickly enough for ammonia salts to be valuable for side-dressing purposes, and that in the mixed fertilizer they should be used only in connection with nitrate salts.

To show the fallacy of such ideas, we present the conclusions given in "The Book of the Rothamsted Experiments" (1917) by A. D. Hall, late director of the Rothamsted Experimental Station, England:

"If the results obtained on the drainage water from the manured plots be examined, it will be seen that nitrification of manures like ammonium salts is extremely rapid; if there is any percolation, nitrates begin to appear in the drainage water immediately after the application of manure. Even in autumn an application of ammonium salts is converted into nitrate in a very short time, * * *."

"On October 25th of that year, mixed ammonium salts were applied to plot 15 and plowed in. Heavy rain followed, so that on October 27th, the drain beneath the plot was running. It will be noticed that in the first runnings, ammonia was to be found. This is a very exceptional occurrence, but the large excess in which the chlorine was present in the water showed that the decomposition of the ammonium chloride and the retention of the ammonia by the soil had progressed considerably. Nitrification had also set in, since the earliest running contained nearly twice as much nitric nitrogen as was found in the sample taken a fortnight before the application of the manure. The proportion of nitrate continued to increase, and reached its maximum in

the discharge three weeks later, by which time the nitrification of the ammonium salts must have been far advanced towards completion." (Page 233-234.)

The nitrification of **Sulphate of Ammonia** is brought about by the same conditions of warmth and moisture that cause plant growth. The ammonia being held by the soil thus serves as a reservoir of plant food which is given up slightly ahead of the demands of the plant, a circumstance which assures an abundance of plant food with but little loss.

In the United States, Dr. Chas. D. Woods, director of the Maine Experiment Station, believing that **Sulphate of Ammonia** was not quickly available enough for the potatoes growing in the cold, late soils of Maine, undertook some experiments to prove that nitrates were necessary in the fertilizer. The results were entirely contrary to his expectations, however, and his conclusions are as follows:

"As the results for the five years tell the same story each year, the experiment will not be continued farther. In two of these years the seasons have been cold, and as unfavorable to bacterial action as is likely to occur. The supposed quicker acting nitrate of soda gave no better yields in those cold, unfavorable seasons than was had with **Sulphate of Ammonia** as the source of nitrogen." (Bulletin 277, Maine.)

In the light of such experimental results, and in view of the fact that farmers all over the world are using satisfactorily **Sulphate of Ammonia** as the side-dressing or top-dressing fertilizer where quick action is demanded, we feel justified in stating that the ammonia of **Sulphate of Ammonia** becomes available quickly enough for all crop demands regardless of seasonal conditions.

For information as to application of **Arcadian Sulphate of Ammonia** write Desk No. 18.

Medina, Ohio
Berkeley, Cal

The *Barrett* Company

Agricultural Department, New York

Baltimore, Md.
Atlanta, Ga.

FARM CROPS

H. G. DOSTER, Editor; ROBERT MAYNE, Assistant.

PROMISING NEW SWEET CLOVER

This new clover promises to be of great value as a pasturage crop as well as for production of forage. Yields of 1 to 1½ tons per acre may be expected. In some sections it is sown in the spring with sowed grains or on wheat. It will likely produce a good crop after the grain has been harvested. It will also be of great value for soil building. In the southern states it has been found that seeds sown in the fall will produce plants that live over winter and bear seed the following year.

In 1916 H. D. Hughes, who is in charge of the farm crops work at the Iowa Experiment Station, discovered a few plants growing in some 500 lots of seed sown in the college greenhouse. These proved to be an annual variety which made a growth of from 3 to 4½ feet high, bloomed and bore seed in a few months.

This variety has been widely tested in a small way by various experiment stations, seedsmen and experimenters all over the country. The plant seems to have a wide adaptability, but, like ordinary sweet clover, is susceptible to acid soils. On good soils it thrives well and promises to be a popular crop in the future.

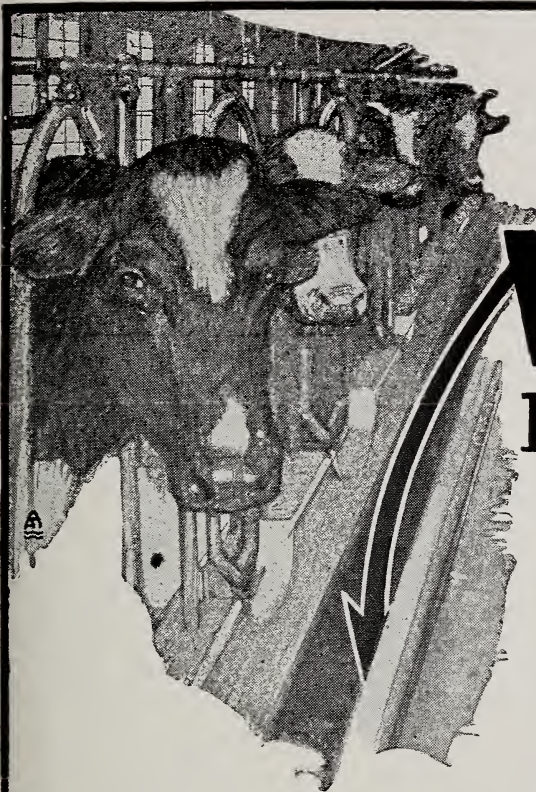
THE FARM CROPS GARDEN AND EXPERIMENT PLOTS

Have you ever seen a hog peanut, the trailing legume that grows wild about Columbus and bears seed pods both above and under ground? If you ever pulled one up you probably addressed a remark to the chief Roman deity concerning the size of those nodules and

then jumped three feet high in order to save yourself from bursting with the elation that comes from making a major discovery. But after deflating and then looking more carefully it appeared that what you took to be nodules—enormous soil reclaiming nodules—were not the real nodules at all but underground seeds. No, it is not a cross between a bean and a potato; neither is it a volunteer peanut plant grown from the roasted ones spilled there by strolling lovers who munched as they walked and wooed. Anyway, whatever it may not be it is a wild legume with traits that are of interest to an imaginative mind.

Have you ever seen, did you ever know that there existed 150 varieties of wheat? Wouldn't you like to see, all growing on one acre of land, not only 150 different kinds of wheat but 100 varieties of barley and as many of oats? You might like to know what the nearest wild relatives of these grains look like, too. If you had them right before you perhaps you could puzzle out whether one or more and which ones of these field species, together with the help and nurture of our own Nth power grandparents of the Stone Age, probably gave birth to the cultivated varieties of wheat, oats and barley which through countless prehistoric ages and fewer historic ones down to the present time have played the all important role of saving man from starvation while he fought and conquered the numerous hostile elements of his environment.

Everyone knows that linen thread and linseed oil are made from the flax plant, but all might not recognize the little



WHAT

Do you put
in there?

FEED, yes. But —
WHAT KIND is it?

At the fairs and dairy shows, many of the most successful dairymen tell us they get more dollars' worth of

milk out of a dollar's worth of BUFFALO CORN GLUTEN FEED, fed mixed with wheat bran or millfeed, oats, etc., than any feed they know of.

They probably never had anybody offer a reason *why* BUFFALO CORN GLUTEN FEED makes milk the way it does. They did not care WHY so much, as long as they got the milk. But the *very high digestibility*, in large measure, *accounts for it*.

See that there is plenty of BUFFALO CORN GLUTEN FEED mixture in the feed trough in front of your cows—and you will understand *why* BUFFALO CORN GLUTEN FEED is so well thought of on thousands of real dairy farms.

FEED UP! Your dealer should have BUFFALO CORN GLUTEN FEED. If he does not, write us for literature and sample, giving us his name and address.

Corn Products Refining Co.
New York MANUFACTURERS OF Chicago
BUFFALO
CORN
GLUTEN FEED



blue flowered plants themselves. Perhaps you are familiar with the appearance of hemp, rice, peanuts and sugar beets, with Sudan grass, hairy vetch and crimson clover, but you may not have seen Japan clover, fenugreek, seradella, sainfoin, and 30 or 40 other grasses and legumes which are of more or less agricultural importance somewhere in the world. You have heard about soybeans and have seen a field of them, perhaps, but you may not know that there are more than a hundred distinctly different varieties, some of them as unlike each other as pop corn and field corn.

All of this brings me to the point of saying what I set out to tell, that any time during the growing season all the things I have mentioned and more besides are to be seen in the small field just west of the Homeopathic Hospital and south of the Botany greenhouse. This is the farm crops garden. It contains a fairly complete collection of all temperate zone plants that are used anywhere in the world as field crops. Few people except crop specialists or economic botanists would fail to find there something new and interesting.

This garden furnishes living specimens in summer for the students in crops courses and dried specimens for winter laboratory classes. It is the ambition of the Farm Crops Department not only to enlarge the collection but to make the garden attractive and self-explanatory. It is hoped that students and the university community will make use of this display. Many of the things growing there are really not grown for display at all but are under experiment. Many are being tested carefully for their yielding ability and others are parts of plant-breeding experiments in which new varieties

are being produced and tested while the laws of heredity are being studied.

Prof. J. B. Park.

BURNING CORN STALKS

On the average soils of Ohio the burning of stalks is always bad practice. The stalks from a fifty-bushel corn crop contain about twenty-four pounds of nitrogen, about three pounds of phosphorus, and twenty-six pounds of potassium. In burning, the nitrogen only is lost to the soil, altho naturally the phosphorus and potassium which remain in the ashes are left along the line of windrows, rather than distributed over the field. Of course, one would rarely expect to replace this nitrogen in commercial fertilizer, but if he should, this twenty-four pounds would cost, at normal prices, \$4.80.

The loss of the organic matter is also an important item. Soils should have returned to them every bit of crop refuse on the place in order to maintain the supply of humus in the soil. In burning corn stalks both the nitrogen and humus are lost to the soil, and on the average farm these are the substances which are most difficult to maintain.

CAMPUS ECHO

(Continued from page 235)

Among these will be E. T. Meredith, U. S. Secretary of Agriculture; J. R. Howard, president of the National Farm Bureau Federation; Gray Silver, legislative agent for the national organization; Ruby Green Smith, New York state leader of home demonstration agents; O. E. Bradfute, president of the Ohio federation; M. D. Lincoln, secretary, and H. C. Ramsower, director of agriculture extension of O. S. U.

Insures Cow Health

THE insulating blanket of still air in a Natco stable wall prevents sudden temperature changes. It protects the health of your cows and keeps up the milkflow in uncertain weather. Natco Hollow Tile walls do not gather moisture as do walls of solid masonry, nor do they absorb grease, dirt or foul odors.

Natco Barns

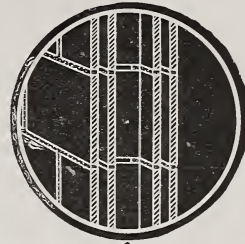
are a permanent *investment*—not an expense. They need no painting and very seldom require repairs. They withstand severest windstorms and are fire-safe, being constructed of burnt clay tile. Natco walls are exceedingly strong. Masons lay up these walls very rapidly, easily handling the large-size units.

Whatever you intend to build, build it with Natco Hollow Tile. Many uses are pictured and explained in our book, "Natco on the Farm." Write for it today—*free*.

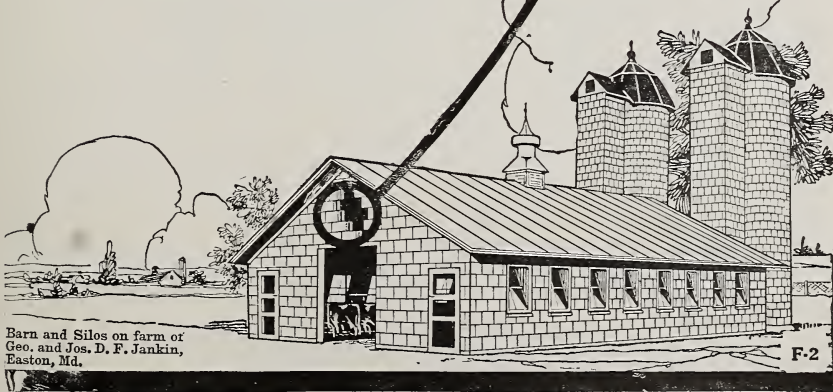
National Fire Proofing Company

1132 Fulton Building Pittsburgh, Pa.

23 Factories assure a wide and economical distribution



Section of Natco wall showing still air spaces



Barn and Silos on farm of Geo. and Jos. D. F. Jankin, Easton, Md.

FARMING MUST BE PROFITABLE

It is universally agreed that the prosperity of the business interests and the welfare of the entire population is dependent upon or greatly influenced by the relative prosperity of agriculture. Is it not equally obvious that agriculture as an industry can not prosper and that farm production can not be maintained or increased to keep pace with the growing population unless the business of farming, individually and collectively, is profitable one year with another? — Secretary of Agriculture Meredith.

AM. POMOLOGICAL SOCIETY

The Fair Grounds was the scene of the meeting of the American Pomological Society last month. Again Ohio State was the winner in the students' apple-judging contest in which three colleges — Ohio State, Toronto Agri-

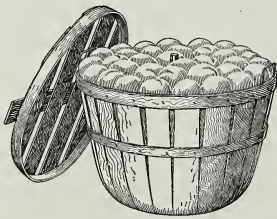
cultural College, and Cornell University—participated.

Many student delegates were initiated into this organization during this convention. W. F. Macown of Ottawa, Canada, and Professor J. F. Lake of Washington welcomed the delegates. A program of music and dancing followed the initiation.

During the convention, which was held at the Deshler Hotel, plans were discussed to include the manufacturers of orchard spraying and fertilizing machinery in the society. Other discussions were held on the quarantine laws, state and national regulations, and marketing problems.

A fellow doesn't appreciate the pumpkin pies that "mother used to bake" until he takes a healthy bite of a brand of the 57 varieties turned out at the meal-ticket emporiums.

Ship ALL YOUR CROPS in the Attractive Universal Package



This neat, clean-looking package makes sales easier and adds to your net profits.

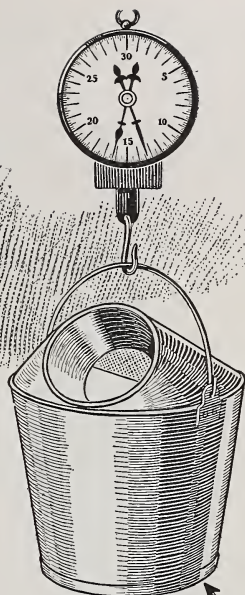
Holds standard bushel. Cover fastens without nails. Equally adapted to every crop. Prevent shipping losses and insure ready sales by shipping your fruits and vegetables in the Universal Package.

Write for prices and name of nearest package dealer.

Package Sales Corporation

212 S. JEFFERSON ST.

SOUTH BEND, INDIANA



Hold Back
anything needed Here
and it shows Here

A COW can give milk to her fullest capacity only when fed the right proportion or balance of milk-making materials. Milk is made up of **protein carbohydrates, fat, minerals and water**, in proportions that, practically speaking, can't be varied. Instead of making imperfect milk, a poorly fed cow gives less milk.

**Cows seldom get enough protein
 or enough calcium**

For that reason, a large part of the roughages and home-grown grains is often wasted. You have to give your cows twice as much grain feeds as when you feed Purina Cow Chow.

Feed Purina Cow Chow

and your cows will get all the protein and calcium needed to balance your carbohydrate roughage. The roughage usually wasted will be used in making milk and a big increase in milk will result.

All we ask is that you give Purina Cow Chow a trial, and let your milk scales show you why you should keep on feeding it. Get the facts as feeders tell them, from a free booklet, "The Purina Cow." Write today.

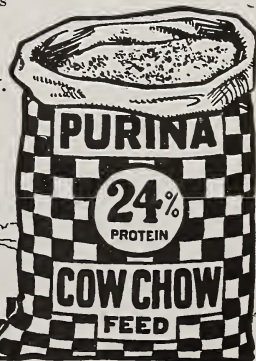
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Buffalo, N. Y.

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NEW YEAR CALENDAR

Prof. W. J. Rader's Academies of Dancing

NEIL AVE. ACADEMY, 647 Neil Ave.

Phones: Citiz. 4431, Main 6189.

Take Neil Ave. car and get off at Poplar Ave.

**Beginners' Classes** organize Tuesday evening, January 4. Get the very first lesson.**Afternoon Beginners' Class** Thursday, 2:30.**Private lessons** afternoons or evenings.**Assembly Nights** Monday, Thursday, Friday and Saturday, 8:15.**Advance Class**, in the front hall, Monday evenings.**Tuition** for beginners: Ladies, per term of 10 lessons, \$5.00; Gentlemen, \$6.00; Private Lessons, 5 lessons \$6.00..

Tuition can be paid \$1.00 a lesson until paid.

Private lessons can be had afternoons or evenings.

The Waltz, Two-Step, Fox Trot and One-Step taught in one term. Go to the school that gives you thorough instruction.

OAK ST. ACADEMY 827 Oak St.

Citiz. 7105; Residence, Citiz. 4431; Main 6189.

A strictly private place for Sorority and Fraternity dances.

ALUMNI

Frances Allen, '19, is instructor in Home Economics in the Malta-McConnellsville High School at the latter place. Under her direction the cooking classes have been serving lunch to the students at cost. This is proving to be a big success and is only one of the good things Miss Allen is doing for the school.

Christine Anderson and Helen Miller, '20, are teaching Home Economics at the Marahore.

Russell George, '16, is superintendent of Emmadine Farms at Hopewell Junction, New York. He showed Guernseys very successfully at the recent National Dairy Show at Chicago.

E. C. Sleeth, '17, formerly connected with the Ag. Chemistry Department at

O. S. U., is now county agent of Ash-tabula County, with headquarters at Jefferson, Ohio.

M. H. Barteer, '08, is acting as county adviser for Geauga County farmers and is right on the job all the time. Farmers' Institute work, High School Club work and similar organizations take up much of his time.

S. L. Anderson, '16, with headquarters at Mt. Vernon, is the live county agent of Knox County, Ohio. He is doing real work and the farmers of Knox County are to be complimented on their good leader.

Jennie Fisher, '20, was appointed home demonstration agent for Montgomery County, with offices at Dayton. Miss Fisher fills the vacancy made by the resignation of Miss Mary Field.

Grace Bahls, '20, is teaching Physics and Home Economics at Wickliff, Ohio.

(continued on page 250)



SWARTZ LIGHT

"It Saves Mother"

SWARTZ UNIT PLANT

Compact, powerful, never failing—it operates economically, continuously and quickly.

It supplies enough electric light to illuminate most any home, and sufficient power to operate washing machine, vacuum cleaner, iron, toaster and kitchen electric utensils, including running water.

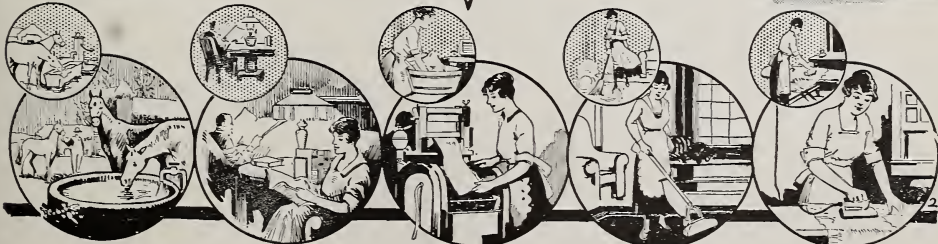
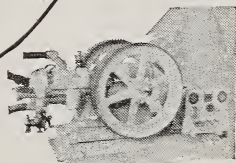
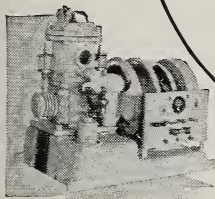
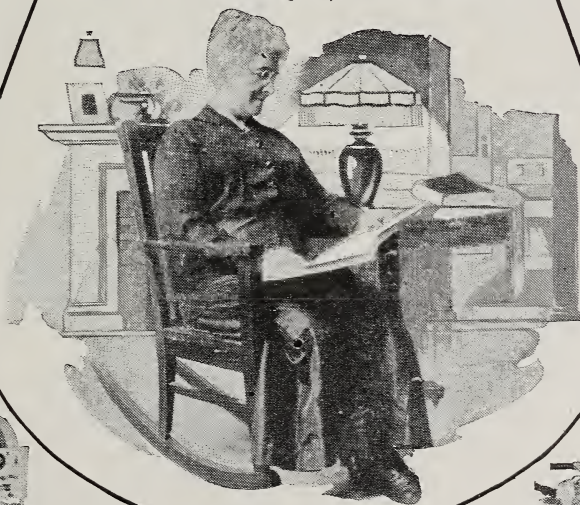
Why compel mother to longer endure unnecessary hardships? Eliminate the drudgery of her farm tasks. Lighten her burden by providing a Swartz Electric Lighting Plant that she may have light, power and service. She deserves it, doesn't she? At least agree to investigate for her sake. Write for free catalog.

SWARTZ ELECTRIC CO.,
Factory at Speedway. Branch 5 N. Meridian St.
Indianapolis, Ind.

SWARTZ PIONEER

A powerful plant, suitable for large homes or farms where extensive operations are necessary. Does all work. It will supply power to saw wood, grind corn, pump barn water or do the dozen tasks that must be done.

Ask for Swartz Light Plant catalog and how "It Saves Mother."



Please mention THE AGRICULTURAL STUDENT when writing advertisers

VALUABLE EXPERIENCE

By D. N. Lutz, '16.

KNOWLEDGE as to the practical results of the methods he has been studying should be of paramount interest to the aggressive agricultural student, in thinking and planning for his summer's work. Such knowledge may be obtained in two ways: by working them out personally, as do the men who "hire out" to some aggressive farmer, and those who go back home and work for their fathers; and through close and intimate observation in some prosperous farming community. This opportunity comes to those who follow the different lines of salesmanship during the summer months. This line of work makes it possible for him to study that community as to its ideals, deficiencies and soil conditons. While visiting the different farmers, the student can follow up some special lines of investigation. By using a note book, data may be noted as to the building, lighting, economical arrangement of stables, granaries, entrances and exits, etc., of large barns. Such subjects as dairying, stock feeding and raising, truck growing and horticulture might be developed in the same manner. Many of the men with whom one talks throughout the prosperous farming localities are former college students and thus the methods they use are just the ones we—in many cases—study today. Thus one finds the very information he is seeking, coming not only from one man, but from many, and by using system in the gathering of such information, conservative conclusions may be deducted.

There is another special benefit to be gained in this line of work. Farmers, in general, do not have as much confidence in the suggestions of college advisers as they ought to have. This is

not because these suggestions are unworthy, but that the college man has not learned how to suggest help and new ideas, without antagonizing. It is his manner of approach that is faulty. In failing to influence, he becomes discouraged, more or less cynical, never becomes the leader he ought to be, and thus loses his greatest opportunity for service. There is an added responsibility resting upon the college man because of his training. His neighbors expect him to be a leader, but this does not mean that he will become such, unless he is acquainted with human nature and goes about his task in the proper way.

The experiences to be gained through the study and practice of salesmanship prepares a man for this larger opportunity of leadership, by teaching him how to approach and influence men to his way of thinking; how to meet and overcome opposition in a tactful way; and how to adapt himself to all manners of men and in all kinds of conditions. These ideas, in their application, are often overlooked.

"I don't know as I ever saw a religion that did not have some good in it. Now, according to the Chinese religion, a man cannot get into heaven until all his debts are paid. (I have several ex-friends that I wish were Chinamen.)"
—Will M. Cressy.

Dean Reese—"Virgil, do you attend a place of worship every Sunday?"

Virgil—"Yes, sir, I am on my way to her house now."—Orange and Blue.

Brevity is the soul of wit but not of love letters.

Toronto Columbus Chicago Minneapolis Kansas City Spokane

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ALUMNI

(Continued from page 246)

E. P. Reed, '14, agent of Champaign county, has his office at Urbana. He is doing excellent work along the lines of Club Work and Cooperative Buying Associations.

In January, 1912, Richard G. Bishop, of Union County, Ohio, came to the O. S. U. and enrolled in the Eight

Weeks Short Course. The result of the training he received may be seen in the record of the dairy herd which he and his father maintain on their farm. Twelve grade and pure-bred Holsteins completed a year's record with an average milk production of 10,053 lbs. of milk and 444.1 lbs. of butterfat each. The top was 10,964 lbs. of milk and 455.5 lbs. of butterfat. Another interesting fact is that almost two-thirds of the herd was under three years of age.

Josephine Brown, '20, has returned to the University as assistant in the Department of Vocational Home Economics.

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Husband—"It is a strange thing, but true, that the biggest fools have the most beautiful wives."

Wife—"Oh, you flatterer."

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The vastly increased milk yield of the pure bred dairy herd has vindicated the years of scientific study of Dairy problems and has also established the principle that quality is always economy.

The distinctive and wholesome sanitary cleanliness which the use of

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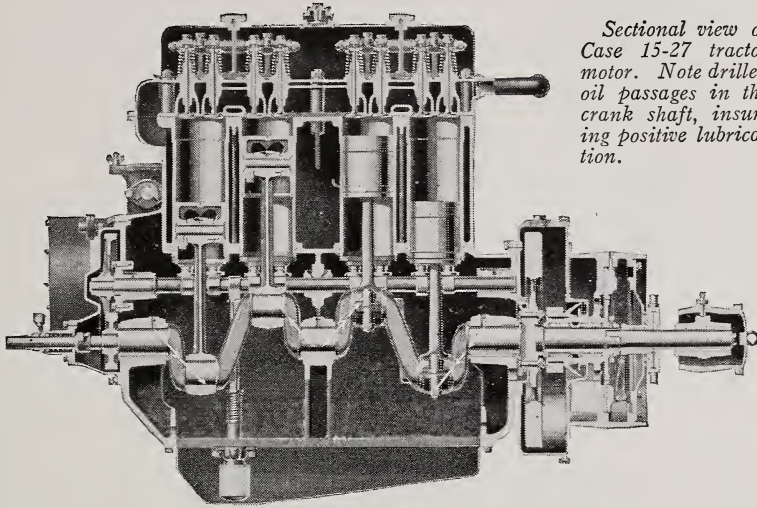
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is providing to the Dairy Industry is likewise the result of scientific study and careful selection.

So consistent in protecting the delicate qualities of milk food is the use of Wyandotte Sanitary Cleaner and Cleanser, proving that the results of increased milk production has been conserved to the Dairy Industry.

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Sectional view of Case 15-27 tractor motor. Note drilled oil passages in the crank shaft, insuring positive lubrication.

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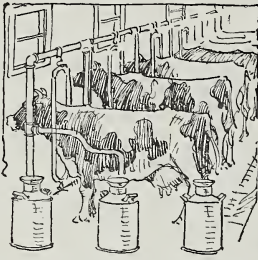
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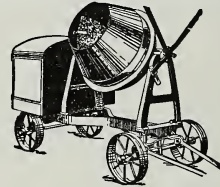
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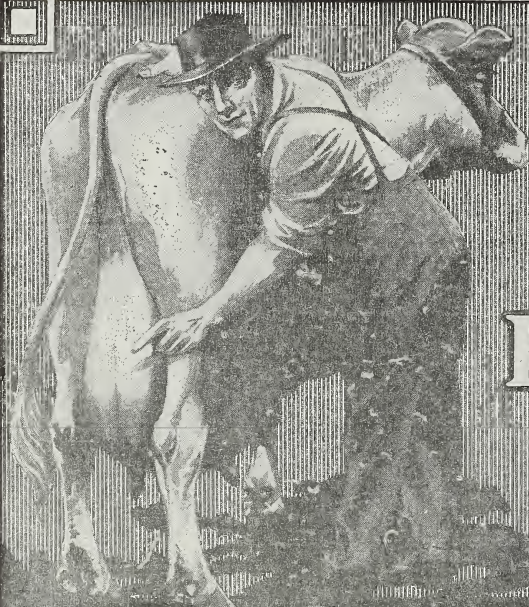
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Yours very sincerely,
 (Signed) J. M. HACKNEY.

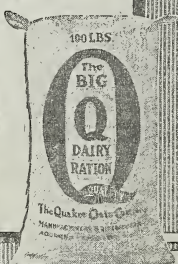
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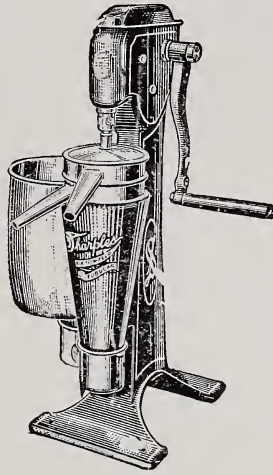


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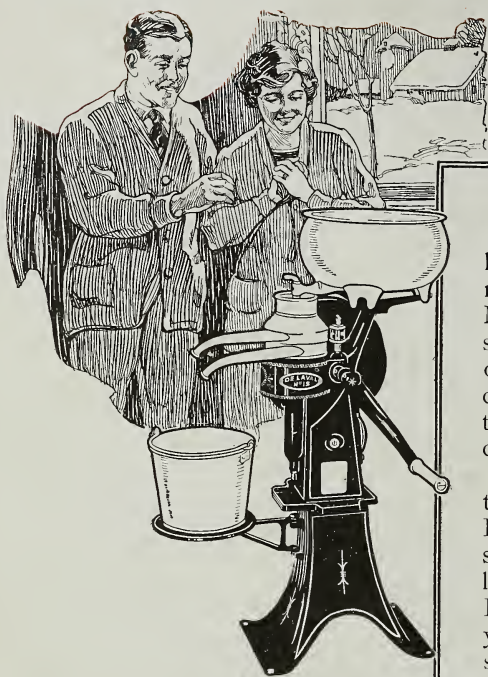


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